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6. ON THE DAILY SCREECHING TIME OF A COLONY OF SPOTTED OWLS *ATHENE BRAMA* (TEMMINCK)

The existence of biological clocks is now a widely known phenomenon and has been studied with numerous organisms at many different levels, ranging from annual reproductive clocks to short cycles at the cellular and molecular level. Several books and reviews (Cloudsley-Thompson 1961, Bünning 1965, Brahmachary 1967, Sollberger 1965) present summaries of the numerous results obtained.

In the present note the authors report the purely observational data on the daily screeching time during emergence in the evening of the Spotted Owlet under natural conditions. The observations comprise data obtained during a period of 138 days extending between 27-viii-67 and 26-ii-68. The rather slight variation in the time of screeching is quite expected in view of the almost universal existence of biological time keepers. Hosking & Newberry (1945) noticed 'how regular the short-eared owls (in England) are in this first visit to the nest with food. Over and over again during several breeding seasons the cock arrived within a few minutes of 8 o'clock.'

We noted the times of emergence and first evening screech over a period of changing seasons, from long days to short winter days lengthening again in the next spring. The observations were carried out in the Indian Statistical Institute garden near Calcutta. The free living spotted owlets lived in a tall tamarind tree (*Tamarindus indicus*). As is well known these owlets generally do not emerge from their hide-outs during daylight although sometimes they are visible and their screechings are sometimes heard at noon or early afternoon. Generally, at about dusk one of the birds suddenly

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screeched loudly and soon after flew out of its nest or cavity and perched on a branch in a comparatively open space. Sometimes the bird emerged first and called a little later. Other birds of the colony would soon follow. On only 8 days the owls did not call before or shortly after emergence. Here we have noted the screeching time of the first bird. The data show a seasonal maximum variation of 72 minutes, the latest time being 6 minutes past 18 hrs. on 27-viii-67, i.e. the day when the series of observation started, and the earliest being 54 minutes past 16 hrs. on 13-xii-67. The following monthly variations have been noted.

TABLE 1

Month	Latest time	Earliest time	Variation in minutes
September ..	17·57	17·27	30
October ..	17·33	17·08	25
November ..	17·12	17·00	12
December ..	17·18	16·54	24
January ..	17·33	17·13	20
February ..	17·54	17·30	24

It is of some interest to correlate the sunset time with the screeching time. On 14 days in different months the sunset time as published in the newspaper or calendar was compared with the screeching time. With a single exception, when the bird called 19 minutes before sunset, the screeching time was a few minutes after sunset as shown in Table 2.

TABLE 2

THE RELATIONSHIP BETWEEN SUNSET TIME AND SCREECHING TIME.
— AND + SIGNS INDICATE CALL BEFORE AND AFTER SUNSET, RESPECTIVELY.
NUMBERS INDICATE MINUTES.

No. of observations	Relationship with sunset
1	+ 6
2	— 19
3	+ 8
4	+ 8
5	+ 12
6	+ 2
7	+ 13
8	+ 7
9	+ 15
10	+ 15
11	+ 8
12	+ 21
13	+ 13
14	+ 14

We also noted the weather conditions against the calendar dates during the months of observation. It seems that except perhaps for some extreme cases of bad weather the inner clock is more important than the external conditions. If light were the most important factor, on dark overcast days the birds would have called earlier and on bright sunny days the intensity of light would have decreased to that degree at a much later time. Our data show no such correlation between screeching time and weather. The variation in screeching within any month is not due to any such weather conditions. For example, on 13-x-67 the screeching time was 17·20 while the very next day it was 16·35 (the earliest call in this month). On both these days the sky was absolutely clear. During the three months of November, December and January the sky was absolutely clear on all the days of observation so that the daily variations could not be due to weather conditions. On the other hand, the progressive seasonal shortening of days is obviously correlated with the progressively advancing screeching time. This is perfectly understandable because substantial evidence has been collected suggesting that there is an endogenous clock which is regulated by exogenous signals.

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April 12, 1971. A. SENGUPTA

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7. BLACK BULBULS *HYPSIPETES MADAGASCARIENSIS* (P.L.S. MÜLLER) IN DELHI

During February and March 1972 I recorded Black Bulbuls (*Hypsipetes madagascariensis*) on several occasions in natural woodland on the outskirts of Delhi. On February 12th and 14th, and on March 7th two birds were seen, and on March 9th a party of three. All these records were within an area of about 1 sq km. The fact that three birds were together on the last occasion suggests that several groups may have been involved.